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SHOSHONE PONDS

HABITAT MANAGEMENT PLAN
N-4 WHA-A2
Ely District

6620

HABITAT MANAGEMENT PLAN
N-4 WHA-A2
Ely District

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Bureau of Land Management
Ely District Office

With assistance by and in cooperation with Frank Dodge
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and
Dr. James E. Deacon
University of Nevada, Las Vegas

Concurred by: Nevada Department of Fish and Game Lorna W. Hardin
Regional Supervisor
January 22, 1971
Date

University of Nevada James E. Deacon
Representative
Dec. 1, 1970.
Date

Approved By: Bureau of Land Management Rexford H. Le Doux
District Manager
December 17, 1970
Date

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I. Introduction

The Shoshone Habitat Area is situated in Spring Valley of eastern White Pine County, Nevada (fig. 1). It is located in the Spring Valley Planning Unit of the Moriah Resource Area (fig. 2). Approximately 1240 acres of public land are included in the habitat area.

The habitat area contains five artesian wells producing warm water suitable for habitation by the Pahrump killifish, Pahranagat bonytail, and Moapa dace. These fishes are included in the publication Rare and Endangered Fish and Wildlife Species of the United States, U.S. Dept. of Interior.

Water from these wells is flowing into a small meadow about 10 acres in size. This meadow supports potential for the development of several potholes for waterfowl habitat.

Wildlife species now inhabitating the area include mallard duck, mourning dove and a variety of non-game birds.

II. Management Objectives

A. Develop refugia for the Pahrump killifish, Pahranagat bonytail and Moapa dace.

B. Develop waterfowl habitat in the meadow area.

C. Provide protection from livestock trampling, pollution, habitat destruction and introduction of exotic species.

D. Promote public awareness, appreciation and support for the protection and preservation of the rare and endangered fishes.

E. Initiate an interpretative program to inform the public of the contents of the ponds.

F. Insure compatible use of all resources in the habitat area, especially for the well-being of the rare and endangered fishes.

III. Management Methods

A. Livestock Grazing

All livestock grazing will be eliminated by fencing the entire habitat area.

B. Wildlife Use

The Nevada Department of Fish and Game will protect the rare and endangered fishes through enforcement of Assembly Bill 660, making it illegal to capture, remove or destroy any species threatened with extinction. The Nevada Department of Fish and Game will also be responsible for regulating the harvest of other wildlife species in the habitat area.

C. Habitat Development and Improvement

The following developments will be required to provide refugia for the rare and endangered fishes and increase waterfowl habitat.

1. Fisheries habitat

   a. Drill a 400 foot well and case with 8" casing. Install a 20' well screen at bottom of well.

   b. Build three small ponds.

      (1) Pahrump killifish - Build a small pond about 40'x40'x5' in size. Pipe water from well directly into pond (fig. 3).

      (2) Pahranagat bonytail - Build a small pond about 25'x25'x5' in size. Construct small stream from well to pond (about 30' in length). Gravel stream bed with pea size gravel. Pipe enough water directly from well to pond to help maintain a constant water temperature in pond. Place a value at the pipe leading from well to regulate the flow of water into the stream (fig. 4).

(3) Moapa dace - Build a small pond about 40'x40'x5' in size. Construct small stream from well to pond (about 30' in length). Gravel stream bed with pea size gravel. Pipe enough water directly from well to pond to maintain a constant water temperature in pond. Place a valve leading from well to regulate the flow of water into the stream (fig. 5).

c. Drill second well, if necessary.

d. Construct a 6' industrial chain link fence around the well and ponds (fig. 6).

e. Install an interpretative sign near entrance of fenced area (fig. 6).

2. Waterfowl Habitat

a. Use an explosive such as ammonium nitrate to create six pot-holes in the meadow area.

b. Divert and channel overflow water from the rare and endangered fish refugia into the pot-holes.

3. Habitat Area Protection Fence

a. Construct a standard 4-strand barbed wire fence around the entire habitat area. Approximately 6 miles of fence will be required.

D. Access Development, Improvement and Management

All roads will be placed on the District Transportation Plan. These roads will be surfaced with gravel and maintained annually.

E. Land Acquisiton, Classification and Withdrawal

The habitat area will be designated as the Shoshone Ponds Natural Area under the Classification and Multiple Use Act of 1964; as such it will be excluded from all forms of land disposal, including the mineral leasing laws.

IV. Management Evaluation

The University of Nevada, Las Vegas Campus, and the Nevada Department of Fish and Game will study and report in writing annually on the population status of the Pahrump killifish, Pahranagat bonytail, and Moapa dace. This data will be used to evaluate the success and effectiveness of the habitat development.

V. Implementation Schedule

A. Current Year

1. Resolve possible conflicts between recreational use and the well-being of the rare and endangered fish.
2. Engineer specifications and drawings of ponds.
3. Determine realistic cost estimates of proposed development work.
4. Design layout of ponds and protective fence to aethetically fit-in with the surrounding landscape.
5. Engineer mechanical layout of ponds and protective fence.

This detailed engineering and landscaping is needed to complete quality development work. Such technical assistance cannot be an input into this plan because of (1) a lack of funding and man months, and (2) lack of such expertise at the District level.

B. Budget Year

1. Drill new well.
2. Construct ponds and streams for rare and endangered fish.

3. Construct industrial chain link fence.

4. Place roads on District Transportation Plan.

5. Designate area as the Shoshone Ponds Natural Area.

C. Program Year

1. Drill second well, if necessary.

2. Create pot-holes in meadow area.

3. Construct fence around habitat area.

4. Prepare brochure on rare and endangered fish program.

5. Initiate on interpretative program.

VI. Alternative Implementation Schedule

If available funds do not permit the implementation schedule outlined above, the following alternatives should be considered.

A. Current Year

1. Resolve possible conflict between recreational use and the well-being of the rare and endangered fish.

2. Engineer specifications and drawings of ponds.

3. Determine realistic cost estimates of proposed development work.

4. Design layout of ponds and protective fence to aesthetically fit-in with the surrounding landscape.

5. Engineer mechanical layout of ponds and protective fence.

B. Budget Year

1. Drill new well.

C. Program Year

1. Build ponds and streams.

2. Construct industrial chain link fence.

D. Program Year + 1

1. Drill second well, if necessary.

E. Program Year # 2

1. Create pot-holes.

2. Construct fence around habitat area.

3. Prepare brochure on rare and endangered fish program.

4. Initiate an interpretative program.

VII. Provision for Review and Modification

All elements of this plan are subject to periodic review. If deemed necessary, objectives, management methods and evaluation studies will be revised. All plan revisions shall be documented and dated.

SHOSHONE HABITAT AREA

Inventory and Analysis

1. Shoshone Habitat Area Condition

A. Present Condition

The Shoshone Habitat Area has the unique value of containing five artesian wells that produce warm water ranging in temperatures from 63° to 74° F year-long. These wells were drilled in 1937. Data on temperature, depth, etc., are as follows: 1/

Well No.	Diam. of Casing	Temperature	Depth
1	6"	74°F	285'
2	6"	69°F	UNK
3	6"	63°F	396'
4	6"	74°F	407'
5	12"	63°F	194'

In an attempt to determine the condition of the wells, an analysis of the water was made by the U. S. Geological Survey. Their findings did not reveal the presence of any chemical that would indicate above normal deterioration of the casing. However, a measurement of Well No. 5 showed its depth to be 40', while The Water Resources Report 33 gave a depth of 194'. From this, it is speculated that the well has either sanded in or the casing has collapsed.

No figures are available on the quantity of water when the wells were drilled; therefore, it is impossible to determine if the flow has decreased during the last 33 years.

Water from the wells flow into a nearby meadow about 10 acres in size. Water from Well No. 2 flows into a small pond before being discharged on to the meadow. Presently, all waters are used by livestock.

The small pond filled by Well No. 2 supports an abundance of small aquatic life (plants and animals) and a variety of larger aquatic plants.

1/ Water Resources - Reconnaissance Survey, Report 33, 1964 U. S. Department of Interior.

On December 7, 1967, an analysis of Well No. 4 conducted by Dale Lockard, Nevada Fish and Game Commission, showed the following characteristics:

Dissolved oxygen - 7.6 ppm
Carbon dioxide - Trace

In September, 1970, Lew Myers, Las Vegas BLM District conducted an additional analysis of water taken from Well No. 4. Following are results of that analysis:

pH - 8.2 ($\pm$ 0.2)
Free acidity - 0 ppm
Alkalinity
hydroxide - 0 ppm
carbonate - 0 ppm
Total (Bicarbonate) - 82 ppm
Hardness (as $CaCo_3$) - 68 ppm ($\pm$10)
Phosphate (total) - 0.6 ppm

According to Lew Myers the water is slightly basic with only moderate alkalinity occurring as bicarbonates. These bicarbonates are good buffers which serve to stabilize the aquatic environment. They also precipitate metals and they are readily available to plants as a carbon source. The water is only slightly hard because of calcium and magnesium content. Also, the water seems to contain a bit of phosphate, which is good for algae production.

The most abundant vegetative species is swamp cedar (an unnamed subspecies of Juniperus scopolorum). An interesting note about this subspecies is its restricted occurrence to Spring Valley and White River Valley. Other vegetative species include pinyon-pine (Pinus monophylla), big sagebrush (Artemisia tridentata), greasewood (Sarcobatus vermiculatus), rabbitbrush (Chrysathamnus sp), sedge (Carex sp), rush (Juncus sp), and an assortment of grasses and forbs.

Grazing by cattle is permitted during the summer and fall months. Use in the meadow is heavy, with considerable trampling occurring. Most of the grasses and forbs outside the meadow are grazed beyond recognition.

Remnants of old cellars and building foundations throughout the habitat area reflect a past domestic use of the area. At the present time, recreational use is minimal.

B. Capability of Habitat for Improvement

In December, 1967, rainbow trout (*Salmo gairdneri*) from the Spring Creek Rearing Station, Baker, Nevada were held in water taken from Well No. 4 for 36 hours. No ill effects were recorded. In the summer of 1969, Dr. James E. Deacon ran similar tests which showed the water to be suitable for habitation by the Pahrump killifish (*Empetrichythys latos*), Pahranagat bonytail (*Gila robusta*), and Moapa dace (*Moapa coriacea*), The presence of abundant aquatic life in the existing pond indicates its potential to support habitat for these fishes. Even at the present rate of flow, the artesian wells produce enough water to fill and maintain water for ponds of adequate size to meet the living space requirements of these fish.

The meadow area supports potential for the development of several pot-holes for waterfowl habitat. Sufficient water is produced to fill and maintain water in these proposed pot-holes.

An examination of the soils show their capability to hold water should small ponds and pot-holes be developed.

2. Population Conditon

A. Present Numbers

The small pond provides habitat for a few mallard ducks (*Anas platyrhynchos*). During the summer and fall months, mourning dove

(Zenaidura macroura) frequent the area and rely upon the abundant water as a drinking source. A variety of non-game birds are occasionally seen.

B. Potential Carrying Capacity and Production

With proper development, the habitat area has the capacity to support significant populations of Pahrump killifish, Pahranagat bonytail, and Moapa dace. Actual numbers the habitat can support must be determined by the Nevada Department of Fish and Game and the University of Nevada, Las Vegas Campus.

The development of waterfowl habitat in the form of pot-holes will carry a small increase in waterfowl production. Actually, this increase will probably be quite limited because of an insignificant waterfowl population in Spring Valley.

3. Utilization of Wildlife

A. Present

No actual harvest data is available on waterfowl or morning dove.

Problem Analysis and Management

4. Problem Identification

A. Limiting Factor Problems

The limiting factors relating to habitat requirements for the Pahrump killifish, Pahranagat bonytail, and Moapa dace, are: (1) their need for warm water above 70°F year round, and (2) their inability to compete with other fishes and frogs.

Although the artesian wells produce water of sufficient temperature, measures must be taken to maintain water temperatures above 70°F year round, especially when the temperature in Spring Valley may fall as low as -15°F. If for any reason, the water temperature falls below the minimum requirements, any of the three populations will surely be eliminated.

Adequate protection must be provided to protect the habitat of all three species from the careless introduction of exotic fishes and frogs.

In addition, the Pahranagat bonytail and Moapa dace require a small stream with a gravel bed for spawning. This habitat must be provided to insure good breeding conditions for these fishes.

B. Utilization Related Problems

Because none of the fishes are of any economic value, utilization is not expected to be a problem.

C. Other Problems

Sufficient data on the condition of the artesian wells are lacking. In view of the critical condition of the remaining populations of all three rare and endangered fishes and the possibility of any of the wells to fail at any time, it is considered hazardous to rely on them as the only source to fill and maintain the refugia with water.

Existing water rights on all five artesian wells belong to Swallow Ranches, Inc. These rights were granted to Swallow Ranches in 1968.

The habitat area contains colorful vegetation which creats an aesthetically pleasing landscape. All physical developments should be planned and executed to eliminate or reduce adverse effects to the landscape.

Occasional recreational use from weekend picnickers and overnight campers is presently being made in the habitat area. With developed camping and picnicking facilities, the area has the capability of drawing increased recreational use on a limited basis. Expanded use of the area for recreational purposes could present a hazard to the well-being of the rare and endangered fish.

5. Problem Solutions

A. Water Temperature

Adequate measures can be taken to insure year round maintenance of the water temperature by:

1. Constructing optimum pond size and depth (will depend upon amount of water available).

2. Designing overflow to provide free exchange of cold water and warm water.

3. Providing a flow of warm water into the pond by directly piping water through an underground 8" pipe leading from the well to pond.

4. In the development for the Pahranagat bonytail and Moapa dace, place a valve at the pipe leading from the well to ponds to regulate the flow of water into the streams. During the cold season, the water can be shut-off from entering the streams, thereby preventing the flow of cool water into the ponds. This arrangement will then permit all warm water (from the well) to enter the ponds through the underground pipe.

5. Drilling the well to a depth of 400'.

B. Protective Measures

Protective measures can be provided by:

1. Developing separate refugia for each species of rare and endangered fish.

2. Not introducing exotic species such as large mouth bass (*Micropterus salmoides*) into the habitat area.

3. Building a 6' industrial chain link fence around the refugia.

4. Locking entrance to fenced area and permit only authorized personnel to enter.

5. Regularly patroling area to minimize vandalism.

6. Placing signs at strategic locations to inform the public of the contents of the ponds.

7. Gaining an awareness and support in the rare and endangered wildlife program.

8. Conducting field trips for the interested public.

C. Stream Requirements

Stream requirements for the Pahranagat bonytail and Moapa dace can be satisfied by:

1. Building small stream between the well and pond (about 30' long and 2' wide).

2. Gravel bottom of stream with pea size gravel.

3. Increase stream depth at the downstream end.

D. Source of Water

A dependable source of water can be realized by:

1. Drilling a new well.

2. Install a well screen in the new well to prevent sanding in.

3. Drilling a second well if the first does not (1) produce sufficient water to fill and maintain the three ponds or (2) maintain constant water temperatures in the three ponds.

E. Aesthetics

Adverse effects to the landscape can be eliminated or reduced by:

1. Seeking technical assistance of a Landscape Architect in the physical layout of the ponds and protective fence.

2. Minimizing damage or disturbance to the vegetation.

3. Building ponds to simulate a natural appearance.

4. Reseeding disturbed areas to grass.

F. Recreation

Consideration can be given to the possible adverse impact of recreational use upon the rare and endangered fish by:.

1. Resolving possible conflicts between recreational use and the well-being of the rare and endangered fish before any development work is implemented.

2. If use of the area by recreationists is deemed a threat to the well-being of the rare and endangered fish, there should be no development of recreational use facilities.

3. If recreational use is considered a compatible use, recreational use facilities should be located and designed to reduce any hazard to the rare and endangered fish

6. Management Methods

A. Livestock Grazing should be restricted to prevent damage to vegetation and conflicts with wildlife use and public demand. To accomplish this, it will be necessary to fence the entire habitat area with a 4-strand barbed wire fence.

B. Wildlife Population Use

The primary use of the rare and endangered fishes will be for research purposes and aesthetics. Any use by research people should be regulated by the Nevada Department of Fish and Game and the University of Nevada, Las Vegas Campus. Provisions for public use should be made through field trips, news media, brochures, and slide presentations.

Hunting for waterfowl and mourning dove should be regulated by the Nevada Department of Fish and Game.

C. Habitat Development and/or Improvement

The following developments are needed to provide habitat for the rare and endangered fishes and improve waterfowl habitat.

Project Name	Type	Size	Priority	Costs
Shoshone Well	Artesian Well	400' 8" casing	1	$10,500.00 *
Pahrump killifish Refugia	Pond	40'x40'5'	2	500.00
Pahranagat bonytail Refugia	Pond Stream	40'x40'x5' 2' wide 30' long	3 3	500.00 100.00
Moapa dace Refugia	Pond Stream	25'x25'x5' 2' wide 30' long	4 4	300.00 100.00
Protective Fence	Cyclone Fence	2 acres	5	4,000.00
Sign	Interpretative		6	150.00
Waterfowl Habitat Development	Pot-holes	6	7	300.00
Habitat Area Fence	4-strand barbed wire fence	6 miles	8	5,400.00 **

* A second well may be necessary, which will mean an additional cost of $10,500.00

** Cooperatively financed with other resource activities

D. Access Development, Improvement and Management

Access is preovided by a paved road from U. S. Highway 50. Several dirt roads traverse the habitat area. These roads should be placed on the District Transportation Plan and receive annual maintenance.

E. Land Acquisition, Classification and Withdrawals

The importance of the habitat area as refugia for the rare and endangered fishes warrant its being identified as the Shoshone Ponds Natural Area under the Classification and Multiple Use Act of 1964. As such, it should be segregated from all forms of land disposal, including the mineral laws.

Habitat Management Recommendations

7. Management Objectives

A. Develop new refugia for the Pahrump killifish, Pahranagat bonytail, and Moapa dace.

B. Develop waterfowl habitat in the meadow area.

C. Provide protection from livestock trampling, pollution, habitat destruction and introduction of exotic fishes and frogs.

D. Promote public awareness, appreciation and support for the protection and preservation of the rare and endangered fishes.

E. Initiate an interpretative program to inform the public of the contents of the ponds.

F. Insure compatible use of all resources in the habitat area, especially for the well-being of the rare and endangered fishes.

HABITAT MANAGEMENT EVALUATION

8. Evaluation

The Nevada Department of Fish and Game and the University of Nevada, Las Vegas Campus will annually study and evaluate the habitat developments for the rare and endangered fish.

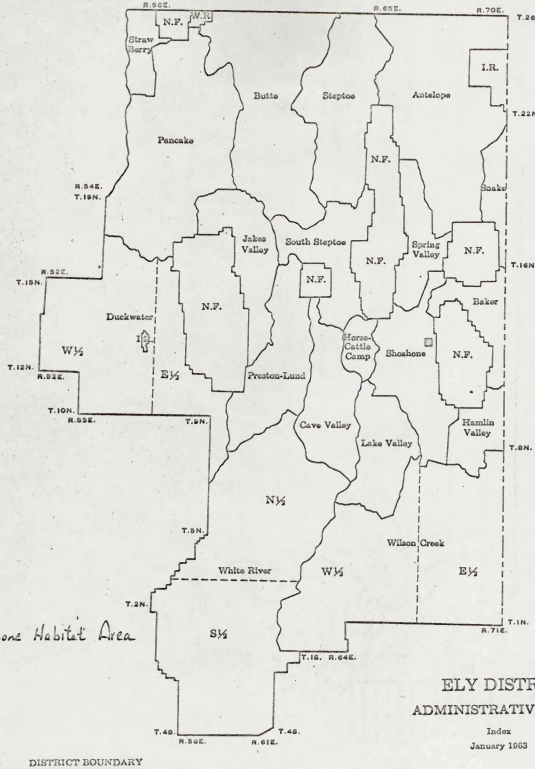

OREGON
IDAHO
HUMBOLDT
ELKO
PERSHING
LANDER
EUREKA
CHURCHILL
WHITE PINE
TOKEY
CARSON CITY
DOUGLAS
MINERAL
NYE
ESMERALDA
LINCOLN
CLARK
UTAH
ARIZONA
■ - Shoshone Habitat Area

Figure 1.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NEVADA

ENGINEERING DIVISION
RANGE AND FORESTRY DIVISION



u-Shoshone Habitat Area

ELY DISTRICT
ADMINISTRATIVE UNITS

Index
January 1963

——	DISTRICT BOUNDARY
——	ADMINISTRATIVE UNIT BOUNDARY
I.R.	INDIAN RESERVATION
W.R.	WILDLIFE REFUGE
N.F.	NATIONAL FOREST

Administrative Unit mapping is available at
Bureau of Land Management State Office
50 Ryland Street, P.O. Box 1551
Reno, Nevada

Figure 2.

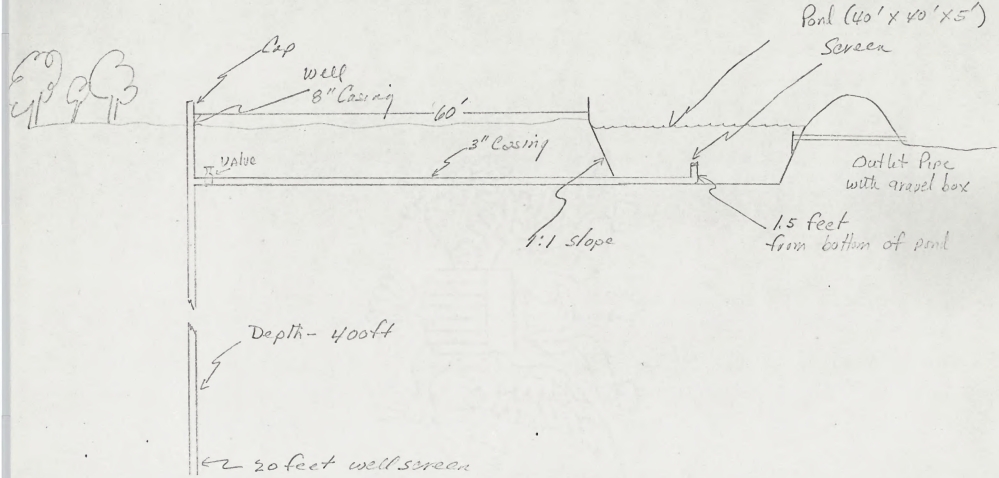


Figure 3. — Development for Pahrump killifish

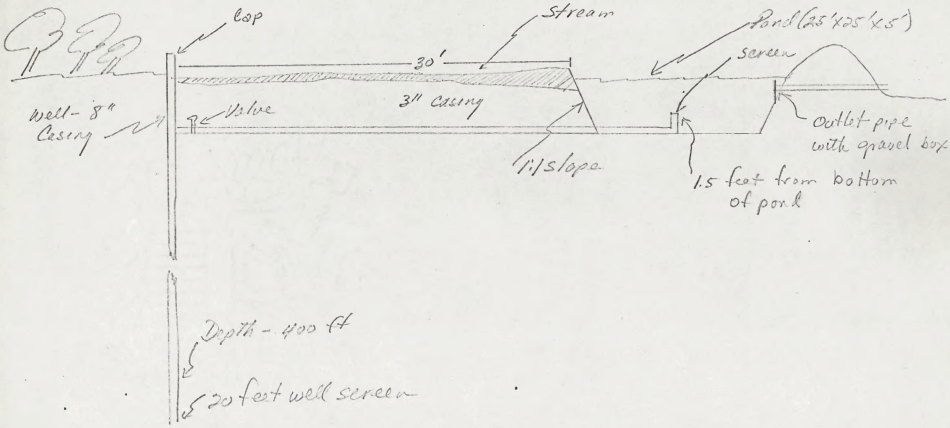


Fig. 4 Development for Pahranagat bonytail

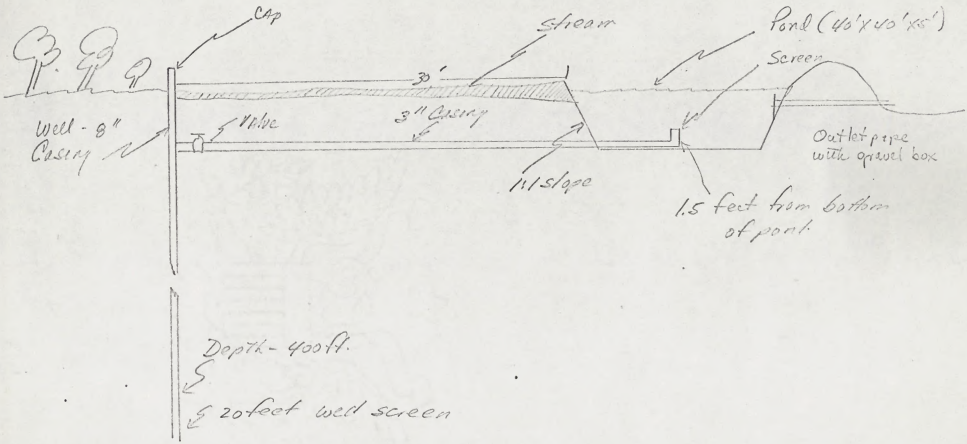


Fig. 5 Development for Moapa dace

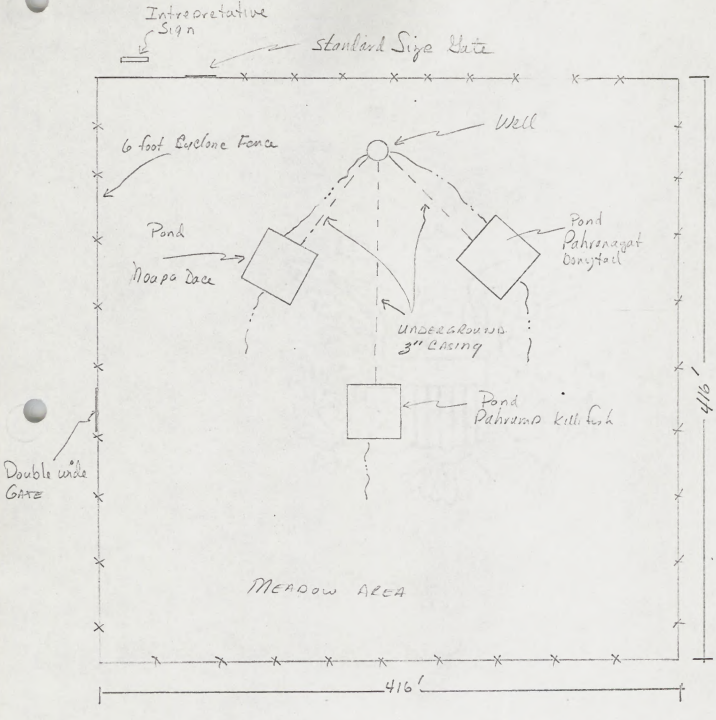


Fig. 6 - General view of proposed refugia for the Pahrump Killifish, Pahranagat bonytail and Moapa dace.

PAHRUMP KILLIFISH HABITAT

Inventory and Analysis

1. Pahrump Killifish Habitat Condition

A. Present Condition

The Pahrump killifish (Empetrichythys latos) is endemic to Manse Spring which is found in Pahrump Valley, Nevada. Little is known about its food and cover requirements other than it is a thermal species living in a warm springs varying in temperature from 74° to 77°F. The average discharge of Manse Spring is about 1.5 cubic feet per second.

B. Capability of the Habitat for Improvement

Relatively slight. The habitat is on private land in a valley in which springs have been drying up for several years. Ground water level is also declining.

2. Population Condition

A. Present Numbers

According to Dr. James Deacon, about 50 breeding adults now remain in Manse Spring. At a symposium on rare and endangered fishes of the Death Valley Complex held on November 18-19, 1966, the Pahrump killifish was considered to be in the greatest danger of extinction. Its habitat is even more threatened than the habitat of the Pupfish (Cyprinidon sp).

B. Potential Carrying Capacity and Production

The undisturbed habitat at Manse Spring previously maintained a population of about 2,000 individuals. The proposed pond would be expected to maintain about 1,000 individuals.

3. Utilization

A. Present

The Pahrump killifish is of no economic importance. This fish is the only remaining subspecies of the genus, Empetrichthys, which is perhaps derived

from an ancestral form in the Colorado River Basin but more likely a very old relict (Hubbs and Miller (1968)). The subspecies is of great evolutionary and ecological significance, particularly to research people.

B. Potential

The preservation of these fishes will insure their continued importance to research people. Their aesthetic value will no doubt become of great importance.

4. Problem Identification

A. Limiting Factor Problems

The limiting factors related to the decline in the population of this species are related to (1) lowering of the water table caused by pumping for irrigation development, and (2) the introduction of competitive and predatory exotic fish species into their habitat. If the present flow of Manse Spring continues to decline at its present rate, it should fail in 8 years.

B. Utilization Related Problems

UNKNOWN

5. Problem Solutions

A proposed solution to the problem of the deteriorating habitat of the Pahrump killifish is to locate new refugia.

PAHRANAGAT BONYTAIL HABITAT

Inventory and Analysis

1. Pahranagat Bonytail Habitat Condition

A. Present Condition

The Pahranagat Bonytail (*Gila robusta jordani*) is endemic to Crystal Spring and Ash Spring in Pahranagat Valley, Lincoln County, Nevada.

Nothing is known about the life cycle or habitat requirements of this form (LaRivers, 1962).

B. Capability of the Habitat for Improvement

UNKNOWN

2. Population Condition

A. Present Numbers

Collection trips by Dr. James Deacon to Pahranagat Valley in 1967 and 1968 resulted in locating very few of these fishes. LaRivers (1962) saw the species at Crystal Spring in 1948-49. The fish currently appears to be restricted to a small population living in a short section of stream above a main irrigation ditch which accepts the combined outflow from Crystal and Ash Springs. It has not been seen or taken in the outflow from Crystal Spring above the confluence with Ash Spring waters (Deacon, 1969).

B. Potential Carrying Capacity and Production

UNKNOWN

3. Utilization

A. Present

The Pahranagat bonytail is of no economic importance. It is a remnant of the Pleistocene White River System, and therefore, is of great evolutionary and ecological importance, especially to research people.

B. Potential

The preservation of the Pahranagat bonytail will assure its continued importance to research people. Its aesthetic value will no doubt become of great importance.

4. Problem Identification

A. Limiting Factor Problems

The limiting factors related to the decline in the population of these fishes are related to (1) lowering of the water table caused by pumping for irrigation development, and (2) the introduction of competitive and predatory exotic fish species into the habitat.

B. Utilization Related Problems

UNKNOWN

5. Problem Solutions

A proposed solution to the problem of the deteriorating habitat of the Pahranagat bonytail is to locate new refugia.

MOAPA DACE HABITAT

Inventory and Analysis

1. Moapa Dace Habitat Condition

A. Present Condition

The Moapa dace (*Moapa coriacea*) is endemic to the Warm Spring area located at the head of the Moapa River in northern Clark County, Nevada.

An analysis of stomach contents made by LaRivers (1962) showed a proponderance of anthropod remains, principally insects, with some vegetal matter.

The Moapa dace is thermal endemic, occurring in waters between 87° and 93°F; it occurs in streams and pools. An analysis of its habitat in the Moapa River showed the following:

Water Color - clear

pH - 7.3

Temperature - 93°F

Oxygen - 3.4 ppm

Methal Orange alkalinity - 223 ppm

Phenolphthalein alkalinity - 0 ppm

Free Carbon Dioxide - 0 ppm

Cholrides - sulfates - present

According to Dr. James Deacon, this fish can live in water having a year long temperature of 70°F.

The Moapa dace remains conspicuously segregated from other similarly sized fishes that occur with it.

B. Capability of the Habitat for Improvement

UNKNOWN

2. Population Condition

A. Present Numbers

The present population of this subspecies is unknown.

B. Potential Carrying Capacity and Production

UNKNOWN

3. Utilization

A. Present

The Moapa dace is of no economical importance. This subspecies is a remnant of the Pleistocene White River System, and therefore, is of great evolutionary and ecological importance, especially to research people.

B. Potential

The preservation of the Moapa dace will insure its continued importance to research people. Its aesthetic value will no doubt become of great importance.

4. Problem Identification

A. Limiting Factor Problems

The springs and headwaters of the Moapa dace are being altered for various commercial domestic water uses. The presence of mosquito fish, mollies, and bull frogs have a detrimental influence on the Moapa dace. All populations are now subjected to competition from these exotic species.

B. Utilization Related Problems

UNKNOWN

5. A proposed solution to the problem of the deteriorating habitat of the Moapa dace is to locate new refugia.

rm NSO 6600-1
tember, 1967
G-BLM Coop. Form)

District: Ely (N-4)

Prepared by: Donald R. Cain Donald R. Cain

Reviewed by: Donald R. Cain Donald R. Cain 11/10/69
BLM Dist. Wildlife Specialist Date

Frank H. Hooker Jr. 11-20-6
NF&G Regional Representative Date

INVENTORY

WILDLIFE HABITAT PROJECT AND/OR HABITAT MANAGEMENT PLAN

Name of Project or Plan Shoshone Ponds Habitat Management Plan

Location of Project or Plan NE¼, Section 2; T. 12 N., R. 67 E., Spring Valley Planning Un

Species Benefited Pahrump Killifish, Moapa Dace, Pahranagat Boneytail, Large-mouth bass, and waterfowl

Description of Job or Project Complete a habitat management plan; recommend a course of action required to provide permanent habitat for the above mentioned wildlife specie and coordinate wildlife use with recreation and livestock grazing in the immediate area.

Justification and Priority The above mentioned fish species are listed on the Department of Interior Rare and Endangered Species List. Their present habitat is i

Scheme of New Habitat: The purpose of this plan is to make recommendation for devel

Cost and Manpower Estimates 1 1/2 MM $1800 (Includes salary and operating expenses)

Cooperative Funding (if any)

Approved: Richard H. Ledgett 12-1
District Manager, BLM Date

Leonard W. Hoskins Nov 24
Regional Supervisor, NF&G Date

REFERENCES

1. Blackwelder, E., C. L. Hubbs and R. R. Miller, and E. Anteos. 1948. The Great Basin With Emphasis on Glacial and Post-glacial Times. Bull. 20. Univ. of Utah, Salt Lake City, Utah. 191 p.

2. Deacon, J. E., C. Hubbs and B. J. Zahuranec. 1964. Some Effects of Introduced Fishes on the Native Fish Fauna of Southern Nevada. Copeia 2: 384-388.

3. Deacon, J. E. 1969. Personal correspondence. Department of Biological Science and Desert Research Institute, Nevada Southern University, Las Vegas, Nevada.

4. Hubbs, C. and J. E. Deacon. 1964. Additional Introduction of Tropical Fishes into Southern Nevada. The Southwestern Naturalist 9(4): 249-251.

5. LaRivers, I. 1962. Fish and Fisheries of Nevada. Nevada Fish and Game Commission, Reno, Nevada. 782 p.

6. Minckley, W. L. and J. E. Deacon. 1968. Southwestern Fishes and the Enigma of "Endangered Species". Science 159: 1424-1432.